TRANSPORT FOR LONDON

PROJECT APPROVAL REQUEST

PROJECT: PRO1632: NEW BUS FOR LONDON

DATE: 18 DECEMBER 2009

---

1 EXECUTIVE SUMMARY

PURPOSE AND DECISION REQUIRED

1.1 The purpose of this paper is to seek additional approval from PRG of £10.876m for the contract award for the design & development phase only of delivering a New Bus for London.

1.2 PRG approval for interim Project Authority was obtained on 9 July 2009 for £0.495m to cover the procurement phase up to the end of 2009.

1.3 This paper is not seeking any approval for Project Authority beyond the design & development phase (which includes the first 5 vehicles) and there is no commitment to place an order for more vehicles. However, Section 3.2 deals with the potential costs beyond the initial delivery phase.

SCOPE AND OBJECTIVES

1.4 The scope of this paper covers the activities of the project following contract award. This includes:

- The design and development phase only
- The delivery of a 2-stage mock up
- The manufacture and delivery of an engineering test vehicle
- The delivery of a prototype vehicle
- The delivery of the initial batch of 5 production vehicles

1.5 The scope of the project has increased since the last paper was presented to include an initial batch of 5 vehicles. Although it is expected that these 5 vehicles will eventually be transferred to a bus operator, the initial procurement will be by TfL. The inclusion of the first 5 vehicles into scope is due to the fact that both final bidders made it conditional that five buses were built in order to undertake full and proper testing of the new vehicle and allow for contingency. They also allow TfL to comply with the Mayor's requirement to see more than one bus in full service by May 2012.

COSTS

1.6 The development of the costs are given overleaf:

Current Financial Authority

The original Financial Authority of £3.3m included in Surface Transport Business Plan is given below in table 1, along with the current Q3 re-forecast Plan of £11.4m, phased as shown.

Table 1

Financial Authority £m	08/09	09/10	10/11	11/12	Total
Original Bus Operations Business Plan	**0.143**	**0.100**	**1.600**	**1.500**	**3.343**
Current Bus Operations Q3 Forecast	**0.143**	**1.305**	**5.297**	**4.626**	**11.371**
Variance	**0.000**	**1.205**	**3.697**	**3.126**	**8.028**

Current Project Authority:

The current Project Authority is £0.495m is shown in table 2:

Table 2

Project Authority £m	**Total**
Current Project Authority	**0.495**
Additional Project Authority	**10.876**
Total Project Authority	**11.371**

Additional Project Authority Sought:

Additional project authority for this project is sought for £10.876m which covers the scope of this paper as stated in 1.4 above and shown in table 2 above.

Forecast Total Project Cost

The forecast total project cost up to and including the design and development phase of the delivery of the prototype and the first 5 vehicles is £11.371m. The background to the change from the original Business Plan figure of £3.3m is given below in table 3, based on the highest bid. The original figure was based on early estimates obtained from a range of manufacturers during market testing in 2008 for a similar new product launch.

Table 3

Area of increased costs (based on highest bid)	**Vs highest bid £m**
Inclusion of management contingency	**1.6**
Inclusion of project risk	**1.2**
Inclusion of first 5 vehicles	**1.9**
Increase in D&D cost	**3.4**
Variance	**8.1**

Notes

1. The second bidder's D&D costs are £1.1m lower .
2. The increase of £3.4m in D&D costs is due in part to a more advanced technological solution

Next phase costs

The next phase costs are based on the costs of the highest bid from the current shortlisted bidders. The actual contract cost will be based on the eventual award made. Table 4 below shows the current phase and the next phases.

The future costs associated with the operation of the new buses and the potential funding implications are covered in section 3.2-3.3.

Table 4

Phase of expenditure £m	**08/09**	**09/10**	**10/11**	**11/12**	**Total**
1: Competition, initiation, market testing phase	0.091				**0.091**
Project Management	0.019				**0.019**
Sub Total	*0.110*				***0.110***
2: Procurement, specification phase, inc project management	0.019	0.217			**0.236**
Legal	0.014	0.099			**0.113**
Sub Total	*0.033*	*0.316*			***0.349***
3: Contract phase – design & development		0.779	4.441	2.570	**7.790**
Project management		0.075	0.179	0.090	**0.344**
Communications & Stakeholder Engagement		0.018	0.011	0.022	**0.051**
Management contingency 20%				1.558	**1.558**
Risk mitigation 15%		0.117	0.666	0.386	**1.169**
Sub Total		*0.989*	*5.297*	*4.626*	***10.912***
Total	**0.143**	**1.305**	**5.297**	**4.626**	**11.371**
Cumul.	**0.143**	**1.448**	**6.745**	**11.371**	

BENEFITS

1.7 The primary benefits of the new bus will be:

- A modern state-of-the-art bus designed specifically to meet the needs of bus passengers in London and that would become a new icon for the capital city
- A design that meets and exceeds standards for sustainability, emissions, accessibility and fuel efficiency.
- A legacy of new standards which could be rolled out into other bus designs.
- An open rear platform that would enable boarding and alighting (when traffic conditions allow and where safe to do so) in between formal fixed bus stops.
- A 3-door, 2-staircase design that would enable quicker boarding and alighting at bus stops, hence reduce overall journey time.
- Additional customer service, safety and security through the operation with a second crew member

For the purposes of the business case the following benefits have been modelled and monetised over a 14 year operation life for each bus and are given in table 5 below:

Table 5

Benefits over 14 years undiscounted & uninflated	*Total value (cf. hybrid)*	*Total value (cf. diesel)*
Presence of a second crew member Provides perception of additional safety & security. Can assist with passenger information and general passenger assistance.	£18.0m	£18.0m
Improvement in journey time through reduction in bus stop dwell time Due to the design having 3 doors and two staircases the passenger flow is much improved as compared to a conventional layout bus. The layout also enables "open boarding" allowing passengers to board and alight through any of the 3 doors.	£21.0m	£21.0m
Reduction in individual journey time through ability to board and alight in between bus stops This benefit has only been modelled on the basis of safe boarding and alighting opportunity at traffic light junctions.	£2.7m	£2.7m
Emissions saving This benefit is modelled on the basis of a £52/tonne/year saving, given that the NBfL will have a lower CO2 emission rate than a standard hybrid bus	£3.2m	£14.5m
Safety disbenefit The New Bus for London will introduce a new safety risk that is not present on existing buses, so for that reason this benefit has negative value. Although the new bus will have a range of passive and active safety features as well as benefiting from the presence of the second crew member whose duties will include the supervision of the platform area, the modelling is based on the validated safety statistics from an number years leading up to 2003 of the operation of Routemasters. These statistics are un-moderated (given the enhancements noted above) and should be considered a very pessimistic worst case scenario.	-£45.7m	-£45.7m
Total	-£0.8m	£10.5m

2 BACKGROUND

2.1 Since the last paper the procurement exercise has been undertaken and there are currently two bidders shortlisted for final evaluation. A final evaluation and decision will be undertaken following a presentation on 9 December of the styling proposals, and an update will be provided verbally at the PRG on 18 December.

ALTERNATIVES CONSIDERED

2.2 There has been no change since the previous paper.

3 PROPOSED SOLUTION

3.1 The specification has evolved during the tender process and the main features of the bus and the scope of the project are as follows:

- A 2 staircase layout
- 3 doors, with the convertible open rear platform now having a powered door
- Scope of project now includes the first 5 production vehicles

COSTS AND FUNDING BEYOND DESIGN & DEVELOPMENT

3.2 The details of the project costs to deliver the prototype are detailed in section 1.5. If the decision is taken to deploy the New Bus for London, there will be additional as yet unbudgeted incremental cost of procurement and operation. For the purposes of the business case a reference number of 600 buses are assumed to be a notional maximum deployment and it is assumed that these costs will be the responsibility of the bus operators who will operate the buses on the designated routes. These route contracts will be subject to the standard tendering and procurement processes.

3.3 However it is recognised that the new bus, by the very nature of its uniqueness, will incur some additional operational and acquisition costs for the bus operators (which will be passed on to TfL) which are not in the current Business Plan. These costs include, for example, the staff costs of the second crew member, the premium of the new bus over and above the costs for a standard hybrid (expected to be in operation in 2012 and beyond), and the potential increased cost of ownership due to the unknown residual values and leasing arrangements. Table 7 below takes into account these additional costs over the period of the Business Plan. At this stage we have assumed that there are no costs associated with the substitution of the new bus into existing routes or fleets.

Table 6

Deployment of Vehicles	**11/12**	**12/13**	**13/14**	**14/15**	**Total**
Crewed	50	100	100	0	250
OPO	0	75	100	175	350
Total	**50**	**175**	**200**	**175**	**600**

- The notional deployment is for 600 buses, comprising 250 crewed and 350 OPO (based on a non-rear platform variant). Of these 600 approximately 12% are retained as spares The new buses are phased in at a rate of approximately 200 every 12 months over approximately 36 months, as set out in table 6 above.

Table 7

Notes (see 3.4)	Estimated unbudgeted operational costs								
	£m	11/12	12/13	13/14	14/15	15/16	16/17	17/18	Total
1	Labour costs of 2nd crew member	3.10	9.57	16.40	16.83	17.26	17.71	18.17	99.04
2	New ticketing equipment	0.12	0.43	0.56	0.59	0.26	0.26	0.26	2.50
	Total	**3.22**	**10.00**	**16.96**	**17.42**	**17.52**	**17.97**	**18.43**	**101.54**
3/4	Incremental vs. planned Hybrid Bus	0.03	0.20	0.45	0.72	0.77	0.66	0.03	2.86
5	Incremental vs. planned Diesel Bus	1.63	8.57	17.13	25.26	26.02	24.40	15.49	118.5

3.4 Assumptions

All costs above in table 7 are subject to standard TfL values for materials inflation and CPA, in addition the following baseline assumptions have been made:

- Note 1: The labour cost for the second crew member is £30k/yr with 12% cover for absence. The open platform variant is crewed 2 shifts per day Monday – Friday
- Note 2: Ticketing equipment costs assume 3 UVs per bus fitting and maintenance costs
- Note 3: Maintenance & support costs of an NBfL vehicle are in line with a hybrid.
- Note 4: Assumes the write off over 5 years of the £9K premium per vehicle for the NBfL over a standard hybrid plus the fuel efficiency cost savings
- Note 5: Assumes the write off over 5 years of the £129K premium per vehicle for the NBfL over a standard diesel plus the fuel efficiency cost savings
- Management contingency is 45% and technical risk of 20% is included in lines 3-5 in accordance with TfL Business Case guidance. However it should be noted that the base unit cost of NBfL vs hybrid is £9k and vs diesel it is £129k with a contractual unit of cost of £319k for a NBfL.

The market for hybrid buses is maturing slower than expected and the bus operators are tending to be risk adverse in their proposals to introduce hybrids onto routes as part of the Bus Network tendering process. Feedback from the operators is that leasing companies are ascribing no residual value for hybrids after a 5 year life, as it is new technology to the bus market. If these market conditions exist at the planned roll out date the existing estimates would be understated. This situation presents funding challenges to the stated assumption, that from 2012 all new buses joining the fleet will be hybrid. Accordingly, we have considered a range of potential scenarios for the future cost implications of NBfL. TfL Corporate Finance are in the initial stages of investigating the use of special purpose vehicles which will present a further funding option for consideration as part of the subsequent approval for full scale production.

BUSINESS CASE SUMMARY

3.5 A cost benefit analysis is included in the full business case. The BCR is -0.01 when the comparison is NBfL vs hybrid, and 0.03 vs a standard diesel, both based on the write off of premium approach over 5 years.

KEY RISKS

3.6 The project to design and develop five production vehicles is deemed feasible on the basis that credible and realistic bids have been received from a number of major manufacturers in response to the public procurement exercise. In addition, extensive negotiations and site visits to the short listed bidders has assured TfL of the capability of the manufacturers to deliver the project to the required quality levels and standards specified. Whilst the specification requires an incremental advance on existing standards and is in many cases ahead of the required legislative minima the project team believe that the New Bus for London will set new standards for fuel economy, emissions reduction, and passenger convenience in a stylish and modern package.

The key risks identified are as follows:

- Technical compliance
- Timetable slippage
- Supplier failure
- Certification
- Funding

In a project such as this a number of significant risks have emerged. Principally these revolve around the technological innovations, packaging or integration. Whilst none of the technologies proposed from either of the shortlisted bidders is entirely new, their integration and combination in a new body and chassis will inevitably pose some challenges. The impact of these risks arising could lead to cost and time over runs or the requirement to scale back the performance requirements. The mitigation plans revolve around the close monitoring and supervision of the development phase, a robust change control mechanism and the willingness to respond and react should the risks arise.

The project scope covers the costs of the entire design and development programme so that the manufacturer does not have to amortise any cost into the production phase. Whilst this approach underwrites the supplier's costs and provides some protection to TfL, external market factors, conditions and the prospect of declining orders means there is remains a risk of supplier failure. Whilst there are provisions in the contract that enable TfL to take the designs and IPR back to tender, there will inevitably be delays additional costs to the project should this risk arise.

Separate to the general technical risks, there is another risk concerning certification in relation to the rear open platform. TfL has engaged with the Department for Transport (DfT), the Vehicle Operator Service Agency (VOSA) and the Vehicle Certification Agency (VCA) and held a number of meetings to investigate these certification issues Whilst the current views are very supportive of the concept of the open rear platform and have advised that there are no obstacles preventing the design and construction of a bus with such a platform in either the current or forthcoming European legislation, approval cannot be assured until a real bus is presented for certification. There is a risk therefore certification may not be forthcoming and that the bus may have to be operated with a closed rear platform. To mitigate against this the project team will facilitate the engagement of DfT/VOSA/VCA with the manufacturer during the design & development phase to ensure all parties can treat any issues as they arise, long before the final certification process.

A major area of risk is the funding situation. Whilst the immediate project is included in the Q3 Forecast up to the delivery of the prototype and the initial batch of 5 vehicles, it is recognised that the majority of the costs for any eventual operational phase are unfunded in the current business plan. Balancing funding will have to be found in due course to enable any roll out plan to be achieved. With regards cost control, there are risks that the project costs could escalate. This has been identified as a concern and hence the nature of the fixed price contract based on performance delivery, and the change control mechanisms to limit and manage any potential pressures on costs.

A total of 15% of the contract costs for Design & Development has been provisioned for risk.

RESOURCES

3.7 Resources for the project during the competition and procurement phases have been allocated as required from a number of Group and Surface functional departments including:

- Group Design
- Group Communications
- Group Legal
- Surface Procurement
- Surface Communications & Stakeholder engagement
- Surface Marketing
- Surface Finance
- Bus Operations Fleet Engineering & Safety
- Surface Performance

The project has been managed by a contractor project manager reporting to the SRO – Director of Operations since June 2008, seconded from another Bus Operations programme. Additional dedicated technical support has been procured with a part time consultant. Project support is shared with another project.

Going forward into the design and development phase, the project will require the following resources as shown in table 8:

Table 8

Role	*Dedicated/Shared*	*Full/part time*
Project Manager	Dedicated	Full
Technical Consultant	Dedicated	Full
Project Support	Dedicated	Part
Contract manager	Dedicated	Part
Fleet Engineering	Shared	Part
Legal	Shared	Part
Finance	Shared	Part

It is the intention that the role of project manager should become a full time employee position from January 2010 for the duration of the design & development phase.

The precise resource requirements (effort, duration, intensity, functions/skill sets etc) will become clearer during the mobilisation phase with the selected manufacturer during the establishment of the baseline project plan and associated stage approvals process.

CORPORATE POLICIES

3.8 No change since the previous paper.

LEGAL / FINANCIAL / CROSS-MODAL / REPUTATIONAL IMPLICATIONS

3.9 Legal

A robust contract has been developed which ensures TfL's interests are protected but which does not commit TfL to place any order for vehicles beyond the first 5.

3.10 Financial

Whilst the phase 3 project implementation costs are expected to be funded within the Q3 Forecast, the ongoing incremental operational costs are not. These include the premium cost of the new bus over an existing volume-production hybrid, the potential additional write-down costs for a unique vehicle, and the costs of the second crew member. These additional un-funded costs are detailed in section 3.3 and are included in the detailed Business Case. These costs are now considerably reduced from the original £227m in the earlier paper to £112m when comparing against a Hybrid. These costs increase to £249m when comparing to a standard diesel.

CONSULTATION

3.11 There has been no further external consultation, however there have been a two briefings to the Mayor to appraise him of progress and to validate some evolving design questions, such as:

- The need not to have a half cab design similar to the original Routemaster. This is due to the packaging requirements of modern drive-train design which do not require the engine to be located at the front of the bus and which allows for a more compact overall design
- The proposal to have a "convertible" rear open platform, which can be closed off at certain off-peak times to enable the bus to operate in one person mode
- The proposal to move to a 3-door design giving greater operational flexibility and opportunities for reducing dwell times
- The proposal to have a two-staircase design giving improved passenger access and reducing congestion
- The move to introduce the first 5 vehicles as part of the scope of the design & development phase.

The proposals were endorsed by the Mayor. In addition the Mayor continues to indicate a strong commitment to the project.

4 CONCLUSION AND NEXT STEPS

4.1 This paper provides a background of the project to deliver a new bus for London, and sets out the key stages of the delivery.

4.2 The paper is seeking additional project approval from PRG to proceed to contract award and the design & development phase for £10.876m.

5 RECOMMENDATION

5.1 The PRG is asked to note the contents of this paper and to approve the current request for further project authority of £10.876m to proceed with the contract award for the design & development phase.

6 ATTACHMENT(S)

6.1 Appendix 1 : Incremental cost model – based on hybrid comparison

6.2 Appendix 2: Quantified Analysis

Appendix 1 – Incremental cost model - hybrid

NBFL Whole Life Cost Incremental Impact Model - NBfL v's Hybrid

Incremental Impact of NBfL — **For Business Plan / Project Authority**

VARIANCE TO BUSINESS PLAN - VERSION v206

			2010 £k	2011 £k	2012 £k	2013 £k	2014 £k	2015 £k	2016 £k	2017 £k	2018 £k	TOTAL 2010-18
VEHICLE PROFILE												
No of Vehicles entering Service					50	175	200	175				600
Cummulative Vehicles					50	225	425	600	600	600	600	600
Spares		12%			6	27	51	72	72	72	72	72
Cummulative Vehicles Excl Spares					44	198	374	528	528	528	528	528
Open Platform					44	132	220	220	220	220	220	220
Closed Platform					0	66	154	308	308	308	308	308

INFLATION ASSUMPTIONS

Bus Network - CPA

		2008	2010	2011	2012	2013	2014	2015	2016	2017	2018
Source: Bus Network Business Plan (v206)			1.5%	2.5%	2.8%	2.8%	2.8%	2.6%	2.6%	2.6%	2.6%

Bus Network - Tender Price

Source: Bus Network Business Plan (v206)

Surface Transport - Employee Wage Inflation

		2008	2010	2011	2012	2013	2014	2015	2016	2017	2018
Source: Budget assumptions (v206)	Operational		1.5%	2.1%	3.5%	3.5%	3.5%	2.7%	2.7%	2.7%	2.7%

Surface Transport - RPI

		2010	2011	2012	2013	2014	2015	2016	2017	2018
Source: Planning- Budget assumptions		-1.4%	2.8%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%

Surface Transport - Construction Inflation (Used for materials inflation)

		2010	2011	2012	2013	2014	2015	2016	2017	2018
Source: Planning- Budget assumptions	2009 rate is based on Jul 2008 forecast	0.0%	0.0%	2.0%	4.1%	4.3%	4.3%	4.3%	4.3%	4.3%

LABOUR COSTS

			2010 £k	2011 £k	2012 £k	2013 £k	2014 £k	2015 £k	2016 £k	2017 £k	2018 £k	
Labour cost for 2 people - £30K each at 2010 prices plus 12% for leave/cover	cost x 2pp	34k	67	67	67	67	67	67	67	67	67	
CPA			0	1	3	5	7	9	11	13	15	
TP			0	0	0	0	0	0	0	0	0	
Labour cost for 2 people inflated at CPA	cost x 2pp		67	69	71	73	75	76	78	81	83	
Total LABOUR cost for Cummulative vehicles excl spares												
	Yr 1 - 44 vehicles				3103							3103
	Yr 2 - 132 vehicles					9571						9571
	Yr 3 - 220 vehicles						16398					16398
	Yr 4 - 220 vehicles							16825				16825
	Yr 5 - 220 vehicles								17262			17262
	Yr 6 - 220 vehicles									17711		17711
	Yr 7 - 220 vehicles										18171	18171
Total For Fleet	250 vehicles excl 12% spares				3103	9571	16398	16825	17262	17711	18171	99041

PURCHASE PREMIUM

			2010 £k	2011 £k	2012 £k	2013 £k	2014 £k	2015 £k	2016 £k	2017 £k	2018 £k	
Vehicle Premium (including incremental conversion cost) per vehicle	cost per vehicle	9k	9	9	9	9	9	9	9	9	9	
Materials Inflation			0	0	1	1	1	2	2	3	3	
Premium per vehicle including Materials Inflation	cost per vehicle		9	9	10	10	10	11	11	12	12	
Management contingency @ 45% of Inflated Materials cost		45%	4	4	4	5	5	5	5	5	6	
Technical Risk @ 20% of Inflated Materials cost		20%	2	2	2	2	2	2	2	2	2	
Total Average premium per vehicle			16	16	16	17	17	18	19	20	20	
Total For Fleet					714	2892	3447	3146	0	0	0	10199

RECHARGE TO TFL OF CONSTRUCTION PREMIUM through Operator route tendering arrangements

			2010 £k	2011 £k	2012 £k	2013 £k	2014 £k	2015 £k	2016 £k	2017 £k	2018 £k	
Total Vehicle Premium Recharged (Includes CPA /Inflation /Mgt Contingency/Tech Risk) over:		5 Yrs										
	Yr 1 - 45 vehicles (exc 5 pre production vehicles)				147	151	155	159	162			773
	Yr 2 - 175 vehicles					595	611	626	641	656		3128
	Yr 3 - 200 vehicles						709	727	745	762	780	3723
	Yr 4 - 175 vehicles							646	662	678	695	2680
	Yr 5 - 0 vehicles								0	0	0	0
	595 vehicles				147	745	1474	2157	2210	2097	1475	10304

MAINTENANCE / FUEL PREMIUM

			2010 £k	2011 £k	2012 £k	2013 £k	2014 £k	2015 £k	2016 £k	2017 £k	2018 £k	
Maintenance premium per vehicle pa inflated for CPA	Incremental cost per vehicle pa	0k	0	0	0	0	0	0	0	0	0	0.00
Total For Cum Fleet (excl spares)					0	0	0	0	0	0	0	0

OTHER TfL Direct COSTS

			2010 £k	2011 £k	2012 £k	2013 £k	2014 £k	2015 £k	2016 £k	2017 £k	2018 £k	
Ticketing Equipment (P. London)					94	329	376	329	0	0	0	1129
Maintenance impact of extra ticketing equipment (P. London) - £500 per Bus					22	99	187	264	264	264	264	1364
Total Other Costs					116	428	563	593	264	264	264	2493
Design & Development of a prototype plus 5 pre production vehicles		10,517k	896	5107	4514	0	0	0	0	0	0	10,517
			896	5107	4514	0	0	0	0	0	0	10517

Summary of Incremental Impacts

			2010 £k	2011 £k	2012 £k	2013 £k	2014 £k	2015 £k	2016 £k	2017 £k	2018 £k	
Total Labour Costs - estimated at 2 staff per vehicle- c£34k inflated at CPA (excluding spares)					3,103	9,571	16,398	16,825	17,262	17,711	18,171	99,041
Bus Premium costs recharged through Bus Network over 5yrs life					147	745	1,474	2,157	2,210	2,097	1,475	10,304
Maintenance Premium costs recharged through Bus Network over 5yrs life (inflated at CPA)					0	0	0	0	0	0	0	0
Other costs					116	428	563	593	264	264	264	2,493
Design & Development of a prototype plus 5 pre production vehicles			896	5,107	4,514	0	0	0	0	0	0	10,517
Total			896	5,107	7,880	10,745	18,436	19,574	19,736	20,071	19,910	122,355

Assumptions:

2nd crew member costs would require 2 additional staff per vehicle at £34k each
Assume 12% of vehicles are spares and therefore no 2nd crew member costs
Actual purchase price of the vehicle assumed to be more than the HYBRID double deck and premium written off over first 5 years of operation.
First vehicles in 2011/12
Worst case d&d costs have been used

Appendix 2: Quantified Analysis

Extracts from BCA (Based on NBfL vs Hybrid)	**Undiscounted £000**[1]	**PV over 14 years £000**
Costs and Revenues		
Operational costs	-15,998 pa	-161,267
Operational cost savings	1,441 pa	11,529
Revenue from Increased demand	-85 pa	-1,012
Secondary income	212 pa	1,532
Net Financial Effect		**-149,217**
Social Benefits		
Journey time improvements		
Dwell Time	1,891pa	17,514
Walking Time	226 pa	2,224
Safety Improvements		
2nd Crew Member	1,538 pa	15,119
Other		
Social costs of Carbon savings	287 pa	2,297
Total		**37,154**
Disbenefit		
Value of preventing a fatality	**-3,859 pa**	**-38,671**
Total social benefit		**-1,518**
Benefit : Cost Ratio		**-0.01: 1**

[1] Note: the figures in this column represent a typical year's costs & benefits as required by the business case assistant.